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ABSTRACT

This paper reports outcomes from a development and evaluation effort focused on a specific World Wide Web-based learning environment (WBLE) for school library media specialists (SLMS). Background information is provided explaining how the decision to create a WBLE for the SLMS course was derived. The three main groups contributing to the WBLE process are described, which include course designers/developers, course facilitators, and course participants. Issues associated with the creation and implementation of the WBLE are discussed in the context of two phases. Design/development issues during the first phase (i.e. the design and development phase) included page vs. site design and cross-platform performance; logistical/management issues included ideals vs. reality, site access, and on-site assistance; technological challenges included modems, browsers, and network stability. During the second phase (i.e., implementation and on-going evaluation), design/development issues included network stability, Web browsers, content delivery vs. data gathering; logistical/management issues included mixing face-to-face and distance interactions, the importance of flexibility and feedback, and keeping the learners motivated. Perspectives of designers/developers, instructors, and learners are offered for clarification and understanding of the potential impact and promise of WBLEs. Includes sample course Web pages). (AEF)

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Web-Based Delivery Of Instruction: Prospects And Challenges

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Abstract

WBI offers a new and exciting avenue for meeting the needs of students, particularly the needs of those students who would not otherwise be able to engage in a formal educational process. WBI enables continued involvement in the learning process in an anytime, anyplace orientation. While the promises of Web-based instruction are great, delivery on these promises has yet to be realized. One reason for the delay may be the lack of shared experiences for how to create and develop these environments. The purpose of this paper is to report outcomes from a development and evaluation effort focused on a specific Web-based learning environment (WBLE) for school library media specialists (SLMS).

Web-Based Delivery Of Instruction: Prospects And Challenges

The number of Web sites currently accessible to the everyday Web-surfer is staggering. Since the creation of the Web in 1992 by Tim Berners-Lee of CERN (a collective of European high-energy physics researchers), millions of Web pages have been added to the milieu and the number continues to increase at an exponential rate. Latest figures estimate that there are over 300-million pages on the Web (Haverkamp & Gauch, 1998; Edwards, 1998). The number of Web sites devoted to educational purposes is also increasing. As instructional Web sites continue to grow, they bring with them a message of enhanced educational environments and student satisfaction. The literature is filled with stories told by instructors and learners engaged in Web-based instruction (WBI) touting its merit and encouraging its use (Bazillion & Braun, 1998).

WBI offers a new and exciting avenue for meeting the needs of students, particularly the needs of those students who would not otherwise be able to engage in a formal educational process. WBI also enables continued involvement in the learning process in an anytime, anyplace orientation. This can be particularly appealing to students who are dispersed across a broad geographic area and/or want to continue with their formal education, but need the convenience WBI can afford. Indeed, WBI does hold a great deal of potential for the delivery of instruction (Owston, 1997).

While the promises of Web-based instruction are great, delivery on these promises has yet to be realized. One reason for the delay may be the lack of shared experiences for how to create and develop these environments. To the credit of those working in this area, not much time has elapsed since the explosion of WBI and the need for this shared knowledge base. While some work has been published [see Khan (1997) for a compilation of chapters related to WBI] the need for more shared experiences and guidelines for creating and developing WBI does exist, and continues to increase daily.

In an effort to contribute to the knowledge based for creating WBI, we will report outcomes from a development and evaluation effort focused on a specific Web-based learning environment (WBLE) for school library media specialists (SLMS). Background information will

be provided explaining how the decision to create a WBLE for the SLMS course was derived. The three main groups contributing to the WBLE process will be described, including course designers/ developers, course facilitators, and course participants. Issues associated with the design and development of the WBLE, including the logistical, management and technological challenges, will be discussed. Perspectives of designers/developers, instructors and learners will be offered for clarification and understanding of the potential impact and promise WBLEs pose.

WBI: OPPORTUNITIES AND POSSIBILITIES

During the spring of 1997, the opportunity to reach a geographically dispersed population of graduate students in a Western state via distance technologies was presented to an Educational Technology program. In this Educational Technology program, one of the most geographically dispersed audiences is the group of students seeking a degree in Educational Media. These students, adults (25 - 50) working full-time, are located throughout the state (a geographic region covering more than 100,000 square miles) and across several school districts. As one of the only Educational Media programs in the state offering a degree preparing students for certification in educational media, the demands placed upon the program are high and continue to increase. These factors made the decision of which educational technology program to target for distance delivery an easy one for the program faculty.

Several courses are offered as a part of the Educational Media program. The course which is the topic of this paper, *ET 533: Reference and Information Management*, is one of four core courses in the program. ET 533 was selected as the course to begin exploration of offering the Educational Media program at a distance for a variety of reasons:

- the course involves a great deal of interaction, something which can be facilitated at a distance;
- many students who were registered to take the course in the Summer of 1997 lived in remote locations from campus; and

- the lead author of the paper was interested in continuing research in the area of WBI and to assist learners obtain information in an anytime, anyplace orientation.

ET 533: Reference and Information Management

The primary goal of the ET 533 course is to assist learners in developing an understanding of the reference process and the activities involved in information management. In developing this understanding, emphasis in the course is placed on the exploration of the various types of materials, databases, and reference services that support K-12 curricula. The learner engages in several activities, including:

- Participation in discussions related to the "Topic of the Week" (e.g., Reference on the InfoBaun);
- Completion of three simulation activities (e.g., Electronic Information);
- Reference tools comparison and contrast paper;
- Electronic networks comparison and contrast paper;
- Reference collection plan;
- Lesson plan; and
- Personal philosophy paper.

Each of the activities are designed to assist the learners in developing an understanding of the nature of the reference process, information sources, and evaluation of reference services.

ET 533: Participants

Three groups participated in the delivery of ET 533 at a distance: course designers/developers, course facilitators, and the learners.

Course Designers/Developers

The two authors from the University of Northern Colorado (UNC) served as the lead designers and developers of the Web site. Together, Dr. Hill and Mr. Murry brought a combined 8 years of experience to the effort of creating ET 533 for Web-based delivery.

In addition to Dr. Hill's and Mr. Murry experience, the experience of other professionals was also utilized during the design and development of the course Web site. Three groups of experts were used during the creation of ET 533: subject-matter experts in the school library media

area (n=4), instructional design experts (n=6), and distance education experts (n=2). Expert review took place during three phases of the design and development process: design, production and implementation. The feedback received from the evaluators was used to inform all design and development decisions by the lead designers.

Course Facilitators

All three authors served as course facilitators for ET 533. Dr. Hill and Dr. Rezabek brought a combined 25 years of experience in teaching courses in the library media/instructional design area. Mr. Murry brought his expertise in the use of the course WBLE to ET 533 and was valuable in assisting the learners in becoming comfortable in working in the on-line environment.

Learners

The learners (n=12) enrolled in the ET 533 course in the summer of 1997 were all participants in the Educational Media program, seeking State certification as media specialists. The majority of the learners enrolled in ET 533 were working in school library media centers at the K-12 level. In terms of experience with the Web, the learners varied considerably. Some possessed considerable experience; others very little. None of the learners had engaged in formal a educational experience via the Web. A final characteristic the learners shared was a willingness to try new things and a desire to make the learning process easier for them from a logistic orientation. These two factors are what really made the offering of ET 533 at a distance possible.

ET 533: Delivery Decisions and Development Support

In seeking to meet the goals of the course and to best meet the needs of the learners, a variety of delivery options were discussed as a result of the opportunity to deliver the Educational Media program, starting with the ET 533 course, at a distance (e.g., compressed video, videotaped sessions, windshield and flying faculty models). The distance delivery mode selected was a Web-based implementation for the course (see Figure 1-3 for examples of the pages from the Web site).

INSERT FIGURES 1-3 ABOUT HERE

The decision of delivery method was made based on several factors: a preliminary analysis of the audience; a review of the goals for the class and how they might best be met; and an examination of the technology available for design and delivery of the instruction. While some delivery options were rapidly discounted, many of the options were feasible and desirable on a variety of levels. Ultimately, the most compelling factors driving the delivery method decision were accessibility and convenience for the student and the course facilitators.

To enable the creation of a WBLE for the course, the lead author of the paper obtained a grant to fund a research assistant, Mr. Murry, to assist with the design and development of the course. Together, the two authors from UNC created initial plans for the Web-based implementation of the course, following through with actual development. The second author also assisted with refinement of the design, and was instrumental in co-facilitation of the course during its implementation.

ET 533: The Creation of a WBLE

The design, development, and implementation of ET 533 took place during a three-month period. Activities can be divided into two stages: prior to implementation of the course and during the course. In building a context for the reader, challenges and issues related to the creation and implementation of the WBLE will be discussed within these phases.

Phase One: Design and Development

After the grant was funded, the two authors from UNC worked on creating storyboards and creating initial ideas for the ET 533 WBLE. A constructivist approach to the creation of distance education was used for designing the ET 533 Web site (Jonassen et al., 1995). As stated by Jonassen et al. (1995): "Constructivist environments engage learners knowledge construction through collaborative activities that embed learning in meaningful context and through reflection on what has been learned through conversation with other learners" (p. 13). Several activities in the course support a constructivist approach to distance education as discussed by Jonassen et al. These include: deriving solutions to simulations/cases related to the reference process embedded in the K-12 environment; the completion of two reflection papers related to the learner's personal

articulation of the reference process; collaboration and conversation in small and large groups in order to reach consensus in meaning making.

A rapid prototyping approach was used for the development of the WBLE. The rapid prototyping approach to design and development involves continuous evaluation and revision to an instructional product/environment as it is being created (Tripp & Bichelmeyer, 1990). For the pre-implementation phase of the course, various experts, following a connoisseur type of evaluation as described by Flagg (1990) conducted evaluation through multiple reviews. The authors spent an intensive month and a half developing the course storyboards and ideas into Web pages for the WBLE, revising and improving the site based on expert evaluation data.

Several issues and challenges were encountered during the creation of ET 533. These are briefly discussed in the following sections: design/development issues, logistical/management issues, and technological challenges.

Design/Development Issues

Page vs. Site Design. How to best structure the creation of the ET 533 WBLE was a major concern to the designers/developers. The question of structure related to designing the site from a page by page perspective, or designing the ET 533 WBLE on a more global level -- site design. The decision was made to follow a more global orientation in creating the site. Thus, when you view the individual pages, there is an inherent "look" and "feel" to the entire site.

Cross-Platform Performance. Another design/development issue related to the ability to access the site regardless of the platform. In our context, there were two primary systems used to access the ET 533 WBLE: Macintosh and Windows. Several issues arose as we developed the site, including:

- a need to view the Web site on both platforms as well as different size monitors to see what the user will be viewing. Functionality, sytle and cosmetics cannot be assumed to be appropriate, and it is never safe to assume WYSIWYG!
- a need to "code" for downward compatibility. This issue was particularly relevant in the creation of the navigational bar on the bottom of the Web site (see Figure 1). The pop

up windows for navigation could be seen on the Mac while there were problems in the Windows environment. This created a need to adjust the pull-up menus to accommodate both platforms.

Logistical/Management Issues

Ideal Vision Meets Reality. As mentioned earlier, we were working under a very tight deadline to get the site up and running before classes started. As a result, functionality became the order of the day. Several items quickly became "nice to have" as we worked to get the site up and running in a month and a half.

Site Access. One logistical/management issue related to where students would be accessing the site. We assumed that students would be accessing from 'home' -- then found that since the class was advertised as on-campus, we had to offer it on campus. As related later in this paper, we again had to shift in midstream to offer off-campus access options that created a brand new set of problems.

On-site Assistance. An associated issue is that we did have on-site help planned (Brandon and other lab helpers) from the on-set of the course. This forethought may have deterred the growth of other logistical/management issues. Further developments discussed later emphasized the importance of on-site technical assistance.

Technological Challenges

Modems and Browsers. The hardware and software used to access the ET 533 were also a concern during pre-implementation of the course. We beta tested the site using a variety of browsers (e.g., Netscape Navigator, Netscape Communicator, Internet Explorer) and versions, as well as a variety of different speed modems. We quickly learned that the optimal browser for ease in access was Netscape Navigator 3.0 (or higher) and a 14.4 modem.

Network Stability. As mentioned earlier, the network at the University were the ET 533 Web site was being served was far less than reliable. It was not unusual for the network to "go down," creating access issues for the designers/developers as they worked on the creation of the

site. Lack of access also created challenges for the evaluators of the site. To ensure that data was received, we also asked evaluators to send in their evaluations via surface mail.

Phase Two: Implementation and On-going Evaluation

Once the course was underway, refinement and enhancement of the course remained as on-going activities. Design decisions were reconsidered; development of the course continued throughout course implementation.

Several issues and challenges were encountered during the implementation of ET 533. These are briefly discussed in the following sections: design/development issues and logistical/management issues.

Design/Development Issues

Network Stability. One of the biggest challenges encountered during the implementation of the course related to the University network. The University servers were constantly going down. This affected the students' access to the Web site, as well as their ability to send e-mail and participate in the listservs.

Web Browsers. Another issue related to the Web browser students were using to access the site. While the students were informed that Netscape Navigator 3.0 was the preferred (and most reliable) browser, it was not always possible for students to access the site via Navigator. As a result, two sites were developed: dynamic and basic. The dynamic version of the ET 533 WBLE relied upon JavaScript code to function. The basic version of the WBLE used basic HTML code. The offering of the two versions enabled easier access for all of the learners.

Content Delivery vs. Data Gathering. Yet another issue related to the student's understanding of the experimental nature of the ET 533 WBLE. While the course was being offered for the delivery of content as a part of the Educational Media program, it was also being developed as a research project. Since these were students majoring in Educational Technology/Educational Media, we talked about the practice of formative evaluation and revision. Though we were almost constantly dealing with technical issues that influenced students' ability to

access and use the site, they had a good lesson in some of the real world frustrations of instructional design and development.

Logistical/Management Issues

Mixing F2F and Distance Interactions. As indicated earlier, the course was initially intended to be taught off-site, then was required to be taught on-site. Since one of the motivating factors for students to engage in WBLE study is the flexibility of time and place, 'forcing' students to come to class all at the same time in the lab seemed to defeat the purpose. However, since we had so many problems with the system/technology, neither could we really experience a totally WBLE setting. So we compromised.

At first, all of us met at the same time in the classroom lab, got online, and pretended we were online at the same time at different locations. Then students who chose to do so accessed the WBLE from their home or work systems while students who chose to come to class worked from the lab--all during regularly scheduled class time. The final "phase" allowed students to participate in learning activities from any site they chose (and could access the ET 533 site) and at a time of their choice. This situation was closest to the "real world" model of WBLEs, though about 30% of the students still came to the class lab during regular class time. The major reason appeared to be technical problems with access to and performance of the WBLE from varied off-campus sites. It was easier to come to class than to struggle with the hardware.

The Importance of Flexibility and Feedback. Students were told by the on-site instructor at the beginning of class that prerequisites included flexibility, an open mind, and a sense of humor. Their response to numerous technical problems, updates and revisions actually prompted important changes and additions to the WBLE. For example, the students complained about the confusing nature of having all types of discussions occurring simultaneously in one chat room, and Mr. Murry revised the chat room to accommodate 'threads' of conversations.

Keeping the Learners Motivated. Students were good sports about 'pretending" they were accessing the WBLE from different locations at different times. The situation also provided numerous opportunities to discuss sociological aspects of WBLE and on-line information access.

One motivating factor we kept stressing when students balked at using the WBLE was that much information in media centers is e-based these days. Therefore it seemed particularly appropriate to learn about online resources using a WBLE.

Multiple Perspectives: Designers, Instructors, and Learners

While several challenges and obstacles were encountered during the design of ET 533 and when the course was implemented, analysis of the data gathered as a part of the on-going evaluation of the course revealed that all audiences were pleased with the outcomes of the course. Specifics are discussed in the following sections.

Evaluation Techniques

The evaluation of the course was approached from an inductive paradigm; that is, the evaluation did not begin with a predictive hypothesis. Rather, a bottom-up approach was taken to discern patterns in the data, with themes generated to explain effective and ineffective aspects of the learning environment (Flagg, 1990). Self-report techniques were used to gather data from the course designers/developers, course facilitators, and course participants. In discussing the results of the evaluation, specific reactions and feedback will be presented in three areas: course designers/developers, course facilitators, and course participants.

Course Designers/Developers

Feedback on the ET 533 WBLE design and development experience was gathered retrospectively from the course designers/developers. Overall, the course designers/developers found the experience to be quite an adventure. However, it was not without hazards.

One of the biggest challenges faced in the design/development of the ET 533 WBLE was the consistency and style of the site. Considerable time and energy was devoted to the "feel" of the site. While it did reap rewards in terms of the students overall reactions (see comments in section below), it was a long, hard battle some days.

Another major challenge related to the dynamic nature of working on the Web. Things are not stable in this environment, often bringing changes that create unanticipated havoc. For example, a Web page was developed which emulated the download site for Netscape. We did this

to assist the students in navigating the Netscape Web site and to help ensure that they downloaded the correct version of Navigator. The day before we went online with the ET533 site, Netscape made major changes to their download site (address and cosmetics and function). This created a need to either update the emulation page on the ET 533 site, or to delete the page from the Web server. We chose to drop the emulation of the Navigator pages and provide only the link to the pages via Netscape.

Hardware was (and remains) a major concern -- especially in terms of the quality and consistency of student access. We learned we certainly can create and implement WBLEs. However, at least two fundamental questions remain to be answered: can we do it well, and can we do it well enough to be cost effective and worthwhile.

Course Facilitators

Like the feedback from the course designers/developers, feedback from the ET 533 WBLE course facilitators was gathered retrospectively. Overall, the course facilitators found the experience to be rewarding, though challenging.

One of the challenges mentioned by the course facilitators related to technical support. As stated by Dr. Rezabek, "*Yes, the technical support is still a major concern*!" All of the students in the ET 533 course were novices in the use of the Web for formal educational purposes. Many of the students had never engaged in a distance education environment of any form. This created a need for extensive technical support throughout the course.

Another challenge mentioned by the facilitators related to the need for flexibility. According to Dr. Rezabek, the flexibility had to be present from the learners as well as the facilitators: "*As a facilitator, I asked [the] students to be flexible, open-minded, risk-taking participants who maintained a sense of humor. I had to be the same way*!" Dr. Hill echoed the need for flexibility, open-mindedness and risk-taking, but with a very different perspective:

> *I was working at the Johnson Space Center when the course was implemented. This put me in a unique situation, where as a facilitator I was at a distance while the learners were on-site for some face-to-face*

interactions. I had to be extremely flexible all around -- in terms of the hardware I was using, in terms of when assignments were submitted, and in terms of the times I engaged in interactions with the learners. It was a real challenge some days, but incredibly rewarding!

While there were challenges, there were also substantial rewards. One of the "neatest things" that happened was that we talked (face-to-face as well as online) about the social impact of online information retrieval (after all, this was a reference class!). That discussion provided a remarkable segues to discuss the social and practical aspects of participating in a WBLE. The content of the reference course, with its emphasis on media specialists looking forward to new learning environments and reference demands in the 21st century, provided a wonderful context to "coax" any somewhat reluctant students to participate in the online aspects of the course.

Another very healthy aspect of this course was that students saw faculty continuing to learn. We made mistakes and admitted them! We asked students to lend their expertise and to collaborate. We took risks and allowed everybody involved to make mistakes and try again! Even though these may not be accepted as crucial aspects of WLBE, they proved remarkably effective in building a learning community.

Team teaching is draining, hard, frustrating, but incredibly growth provoking both for the instructors involved and for the students. It was especially interesting since Dr. Hill was distanced. She was the lead instructor and primarily responsible for providing feedback on students' projects and performance. Though both instructors did answer student questions, there was a definite tendency for students to ask Dr. Rezabek questions first just because she was bodily present two days a week -- though she was inaccessible at all other times!

Overall, the facilitators concluded that the experience was extremely challenging, but incredibly rewarding. And the questions related to the creation and implementation continues to arise. As stated by Dr. Rezabek: *"There is so much more to learn! I'm especially curious about social interaction and learning online."* Dr. Hill stated: *"I continue to be fascinated by the concept*

of community building in on-line environments. I know it happens -- I saw it in ET 533 -- I am just not sure how or why. I would echo Landra: there is so much more to learn!"

Learners

While the information gleaned from the designers/developers and facilitators is important, perhaps the most critical voice in the evaluation process is that of the participants or learners. The learners participating in the ET 533 course were like most adult learners: more than willing to share their opinions and to direct their own learning activities. The learners' ability and willingness to share their opinions was critical in the continual refinement and enhancement to the course WBLE.

Evaluation data was formally gathered from the learners at two stages of the course: mid-term and at the conclusion of the course. While the learners were very willing to let the facilitators know when things were not running smoothly throughout the course, the formal gathering of feedback proved critical to the continual improvement of the course. The data presented below has been broken out into major themes identified during the analysis of the learners' feedback at mid-term and then again at the conclusion of the course.

Mid-Term Evaluation

As a part of the mid-term evaluation of the course, learners were asked to respond to three (3) statements related to the course:

1. List three "neat things" you have learned so far.
2. Discuss any frustrations and/or successes you have experienced in working with the WBLE.
3. Discuss "how it's going" overall.

The following themes were evident in their responses.

Question One: List three "neat things" you have learned so far.

Theme One: Experiences of Others. The ability to draw upon the experience of peers working in the field (i.e., K-12 library media centers) was an important aspect to many of the learners in the course. The ability to share experiences appeared to be enhanced by the electronic technologies used in ET 533 to facilitate interaction. As stated by one learner in the course:

> *There are some really good and knowledgeable people in this class that have a lot of good ideas and experiences to draw from. A few of the people have spent some time on the job already, and it's interesting to draw on their stories when we talk about the issues.*

Another learner in the course echoed these sentiments:

> *I enjoy using the Internet and sending e-mail. I like the opportunity to discuss questions in the weekly chat sessions. It's interesting to read others opinions and thoughts. I feel I am benefiting from talking with class members who have experience working in media centers and share their problems/solutions....*

Theme Two: How to use Tools. The ability to use the tools (e.g., e-mail, listservs, Web) was also reported by several ET 615 students as a "neat thing" they learned by mid-term. Several of the students reported have little to no experience with Internet technologies. The fact that they were able to feel more comfortable with the tools was an important accomplishment. As stated by one learner:

> *...I've learned how to access [the] Internet which was an overwhelming feat individually. [In the past,] I never found the information I wanted and it seemed I was pulled in a million directions. I've been given a solution to that. I'm now less intimidated by the process...*

For another learner, the number of tools they were able to use by the mid-point of the course was an important achievement:

> *I am learning more about using E-mail every day.... I have also been learning how to access and use the WBLE site. These have been new concepts for me. I have particularly enjoyed answering the questions using the chat areas.*

Theme Three: Reference Techniques. Another "neat thing" learned mentioned by ET 533 students at mid-term related to the reference process and how they could improve their performance

as media specialists assisting students with finding needed information -- whether electronic or physical. For some students, this meant learning techniques for searching for information on the Internet. As one learner stated, "I've learned Boolean techniques to help searches on the Internet--what a great thing to know." Another learner stated: "[I learned that] putting quotes (" ") around a subject when entering it in to search the Web limits it to 4 (four) hits or so and not 4,000."

For other students, interaction techniques where enhanced: "I have learned that questioning my patrons will help me manage my time when assisting me with my reference searches." Another student echoed this thought when they stated: "[I have learned] the importance of a well formed reference question." One student related the reference process to personal interaction:

> *The personal aspect is the most important when providing reference services. If the reference librarian is not approachable, interested and gifted with people skills, patrons will struggle with their reference issues.*

Another area students mentioned in relation to reference techniques feel more in the area of reassurance -- reassurance that they were not doing things "wrong" or that they should not expect themselves to know everything. Several comments were made by students related to this area:

- *I have learned that everyone has as many questions about how we will be able to meet all the information demands of the future.*
- *I haven't been doing everyone incorrectly!!! ;-) Although I may seem somewhat insecure as far as being a subject-area expert, my technology and communication skills should help carry me through.*
- *[I learned] there are many more research sources available than I ever thought possible or knew about.*

Question Two: Discuss any frustrations and/or successes you have experienced in working with the WBLE.

Theme One: Learning how to Use the WBLE. Several of the comments related to the frustrations associated with the WBLE related to learning how to use it. While many stated that

they found the experience worthwhile (as reported in the next section), several reported that the learning curve with the tools was (perhaps) more than they anticipated. Some students relayed that getting access off-campus was a challenge:

- *I am experiencing a few problems accessing the network and sending e-mail from home with my Powerbook, but I hope to get it worked out this weekend.*
- *I am unable to have Internet access at my home; this means that I need to go to a friend's house to access the WBLE. However I am very successful operating in the environment once I am in.*

Other students reported that learning how to operate within the WBLE (e.g., finding resources) was a challenge:

> *Some of my frustrations in the WBLE come from finding my way around from place to place. Hopefully, I will become more proficient as time goes on. I find when I am working in the system things go fairly well, however, when I have been off the computer for a few days, I don't always remember what to do*

Theme Two: Invaluable Experience. While many learners reported that working in the WBLE "took getting used to," most reported that it was a valuable experience -- professionally and personally. For some students, working in the ET 533 WBLE meant having to overcome personal anxieties associated with electronic communication. However the value in increasing their ability to assist their students seemed to outweigh the frustrations and fears. As stated by one of the more "technology savvy" students: "I do feel for some of the students who have very limited online skills, but then what a wonderful way to learn the needed technology skills so as to pass them on to your students."

Other comments related to the value of the WBLE included:

- *I feel it's an invaluable experience. A success for me is feeling like I can overcome my anxiety about electronic information sources.*

- *Being that I have access from home to the WWW, I have loved it. You all have really invested a lot of time setting things up, and I am looking forward to taking advantage of this learning opportunity. I'm really anxious to see how it all plays out.*
- *As a player in the future of our district's technology plan, this environment interests me very much. One of the most revealing discoveries I have made about the WBLE is that it can be both an efficient and inefficient means of communication. By this I mean that it is inefficient for us to chat about topics by composing our thoughts on the computer and sending them to each other.... However, it is also an efficient means of communication in that we are forced to write down our thoughts. This makes us think them through more clearly and precisely state them. I also find it very helpful on the receiving end in that I can read and reread something someone else has said.*

Question Three: Discuss "how it's going" overall.

Theme One: Time Management. Several students reported that they felt considerable time pressure in ET 533. Many stated that they felt concern regarding completion of the assignments and readings for the course (e.g., "I'm getting out of the blocks kind of slow, and I need the weekend to get caught up."). Given that the course was offered during a 6-week condensed session in the summer, this was not surprising. However, some of the comments made about time management related specifically to the WBLE and interactions within the environment. In addition to the quote relayed in the previous section (Question Two, Theme Two), another student had the following comment:

> *The WBLE is a great idea in theory, especially for dazzling friends and family on the wonders of technology, but I haven't really used the chat feature enough to feel comfortable with it. When we began working with it last Tuesday, I really felt the need to push away form the*

computer and give myself to time to digest the questions and the information before trying to respond. I felt myself being seduced by the power of the moving cursor rather than taking the time to reflect on what I wanted to say.

Theme Two: Going Well. All of the students reported that they thought the course was going well overall. Specific examples include:

- *It's going great and I really enjoy the setting. We have a great group here. I've found they share the same concerns, frustrations, and enthusiasm that I do for our profession. I can't think of a better way to grow as an educator.*
- *I am happy to say that it is going better than I expected it to be at this point. I was very nervous about taking these courses [library media]. It has been a pleasant surprise to be with such enthusiastic and supportive people.*
- *I think the class is going great. It is very interesting subject matter, and once we become more comfortable with the computer aspect of it (which is happening quicker than I thought it would) it will move along even better.*
- *I feel that I have learned many new things. I really enjoy the class, especially working on the computers.*
- *I appreciate the opportunity to participate in the process with you [Janette], with Landra and Brandon and my classmates. I'm always up for new adventures in learning, especially in a technological setting. The problems are often similar, but the solutions can certainly be revolutionary. Whether this be the case, it has already been very fun and advantageous.*

End of Course Evaluation

As a part of the end of course evaluation, learners were asked to respond to 4 FOUR questions:

1. What did you like best about the WBLE experience?
2. What did you like least about the WBLE experience?
3. What would you recommend doing differently next time the course is offered as a WBLE?
4. Would you be willing to take another Web-based course?

The themes evident in their responses presented by question.

Question One: What did you like best about the WBLE experience?

Theme One: Convenience and Flexibility. The anytime, anyplace convenience of the WBLE was one of the main benefits mentioned by students on the final evaluation. As stated by one student: "I loved being able to do my work at home. It was great being able to pick and choose the time of day I wanted to work, too." Another student echoed and elaborated this statement:

> *I loved being able to telecomunicate to class.... I had the opportunity to go to some meetings in our district and still attend class! The convenience of the environment has a lot to offer. I would not have been able to meet all my summer obligations without this environment.*

Flexibility was also closely associated with convenience for many students in the ET 533 course. As stated by two of the students in the course:

- *I certainly appreciated the flexibility afforded by the WBLE. A couple of times I was off campus accessing the chat discussion while I was still in Longmont getting work done. Having the assignments available anytime, anywhere in computer format provide to be a boon on a number of occasions.*

- *What I liked best about the web based learning environment is its ability to be flexible. I enjoyed being able to work on projects at 2:00 a.m. and hand then in immediately.*

Theme Two: Potential. Several students mentioned that the potential of the WBLE was a positive aspect of the course. Specific examples include:

- *I also believe that reference librarians in the future will be communicating frequently with their patrons in this sort of environment. The practice was greatly appreciated.*
- *Although we weren't sure what we were getting ourselves into when we began this call, I'm REALLY glad to have been given the opportunity to be part of this. Once we got use to the format and electronic means, it only became second nature, as it suppose to I guess.*
- *I think there is potential for this type of learning environment, however, I think there are things that need to be worked out before this will become a standard way of teaching.*

Theme Three: Real Application of Technology. The fact that the course made use of real world technologies in real applications was also mentioned as a positive aspect of the course.

- *I enjoyed the newness and the fresh approach to the material. This class was more than going to the library and looking up material. It was a chance to use the technology and learn more about the reference material and the WBLE.*
- *I really liked to see that the new technology is being used.*
- *I felt that it gave me an opportunity to learn about the material at hand (reference) and learn more about the technology used and how to use it myself.*

Question Two: What did you like least about the WBLE experience?

Theme One: Lack of Confidence in Network. Many students reported feeling uneasy about the network -- especially in terms of sending and receiving assignments. In general, students expressed a concern such as the following: *I worried about whether or not my assignments were received.* Other comments included:

- *...I was uneasy about receiving no feedback on the assignments I submitted electronically. I would have appreciated a reply acknowledging that they had been received intact.*
- *I never was absolutely certain that my projects made it "safely" through cyberspace. This uncertainty is stressful.*

Theme Two: Technology Challenges. Several students in the ET 533 course also stated that technological challenges were a negative aspect of the course for them. The ET 533 WBLE was the first experience with WBLEs for all of the students in the course. While some of the learners had extensive experience in looking for information via the Web, none had engaged in formal learning via the Web.

Many students related the technology challenges to a lack of experience:

- *The only problem I had was that my lack of experience put me at a disadvantage. Not only did I have to struggle with the assignments but it was an additional task for me to provide them electronically.*
- *We needed more practice on the various ways of communicating.*

Others mentioned specific technologies when discussing technology challenges and the aspects of the course that they did not like:

- *The group listserv for the last simulation was a bust for me. I never did get subscribed even with e-mail help from Brandon.*

- *I liked everything except the listserv. I found the mechanics of it difficult to use and for me it stifled my thought process. I found myself having to stop and start too much.*

For others, the least enjoyable aspect of the course related to unreliable or lack of access:

- *The technology is not reliable. Last Thursday the server was down and it made me quite nervous. If I had access at another location, it wouldn't have been a problem; however, this was the only place I could complete the projects. When working in this environment, you definitely cannot procrastinate.*
- *I did not like that I could not access the WBLE from home through most of the course. I would have loved to be set up on-line from the beginning of the course and would enjoy using this system in the future.*

Question Three: What would you recommend doing differently next time the course is offered as a WBLE?

Theme One: Lots of Feedback. This was the number one suggestion from the students in the class: more feedback. For some, a simple reply that the assignment had been received was sufficient: "*[Set up an] automatic e-mail message indicating that assignment(s) have been received...*" Others requested that the feedback be more detailed, but they wanted to receive feedback more frequently and as soon as possible. The students responses to this question directly related to their lack of confidence in the network; in fact, often times the two statements were linked together (e.g., I don't feel confident that my assignments are received. A reply message back letting me know you received it would be great.).

Theme Two: More Training on Tools. This question brought responses related to the student's feedback on technological challenges: "*More training for those of us who have never used some of the technologies before.*" As stated by one student:

- *If I were taking this class again, I would like to see more explanation on how to use all of the mechanics of the system. I was a bit confused at the beginning. Possibly a mini course on how to use the site and the e-mail would be beneficial.*

Question Four: Would you be willing to take another Web-based course?

All participants who returned the end of the course survey responded to this question with a resounding *yes*. Specific comments included:

- *I would love to take more classes that are Web based. It would be nice if we could do more classes off-site since so many of us are traveling long distances.*
- *I really enjoyed the convenience, the practice with the technology and the material.*
- *The advantages of the flexibility far outweigh the disadvantages of the technical problems.*
- *I certainly would be willing to pursue this type of learning again. I enjoyed it very much. I felt that it gave me an opportunity to learn about the material at hand (reference) and learn more about the technology used and how to use it myself. I found this type of learning atmosphere a pleasure to participant in.*

Implications and Recommendations

Working in WBLEs is an exciting area -- from several perspectives: designer/developer, facilitator, and researcher. While we have made considerable strides in the last eight years since the first Web pages were released in Switzerland, we still have many challenges to face and hurdles to overcome.

One of the responsibilities for those of us involved in distance learning, regardless of the delivery system used, is to prime the expectations of student participants. In the ET 533 course,

we stressed that WBLEs are not intended to replicate the traditional face-2-face learning environment. We also talked a great deal about the "experimental" nature of the course, and how student feedback would indeed provide a means for improvement and revision, both during the course, and afterward. This emphasis appeared to predispose students to consider the "oopses" we encountered as learning experiences rather than obstacles hindering their progress.

It also is important to note that the instructors knew that they had to be flexible in terms of expectations regarding timelines, students performance, and content when the technology thwarted "the plan." The modeling was crucial to students' willingness to participate and take the risks associated with a new learning environment. As stated by Mr. Murry, "model the process and give one-on-one assistance" when seeking solutions to individual learner challenges in WBLEs. Practice and a friendly reminder can also go a long way toward increasing learner comfort and willingness to continue to participate.

Another implication for WBLEs relates to course size in terms of participants. We had twelve (12) students in the ET 533 course. This appeared to be a comfortable number given the level of interaction in the course and the course timeframe (six (6) weeks). However, several questions remain to be answered: (1) How many more students could we have enrolled and still provided effective support and promoted learning? (2) Should there a cap imposed on WBLEs? and, a question closely related to the number of participants, (3) Should more than one facilitator always be involved in WBLEs to ensure effective support and engagement with the learners? The answers to these questions seem imperative if we are to continue to develop meaningful learning environments via the Web.

A final implication relates to hardware/software challenges encountered in the ET 533 WBLE. We experienced several challenges in designing and implementing the course Web site. However, we do not feel we are unique in our challenges (see Khan (1997) for other case studies related to WBI). It is imperative that we continue investigation of hardware/software issues related to WBLEs if we are to ensure the long-term viability of this medium for the distance delivery of instruction.

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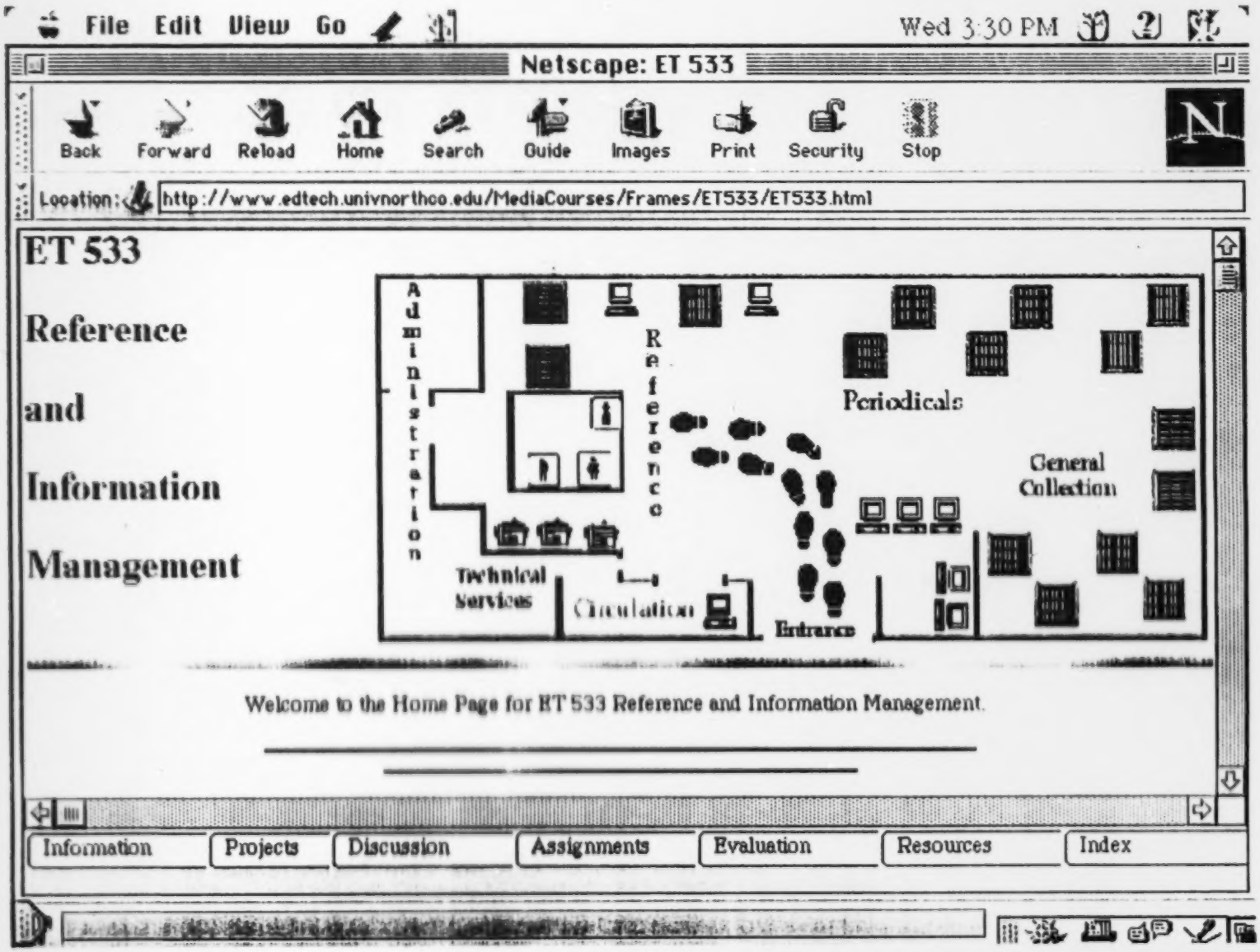
Figure Captions

Figure 1. ET 533 Home Page.

Figure 2. ET 533 timeline.

Figure 3. ET 533 discussion area.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Reference
Periodicals
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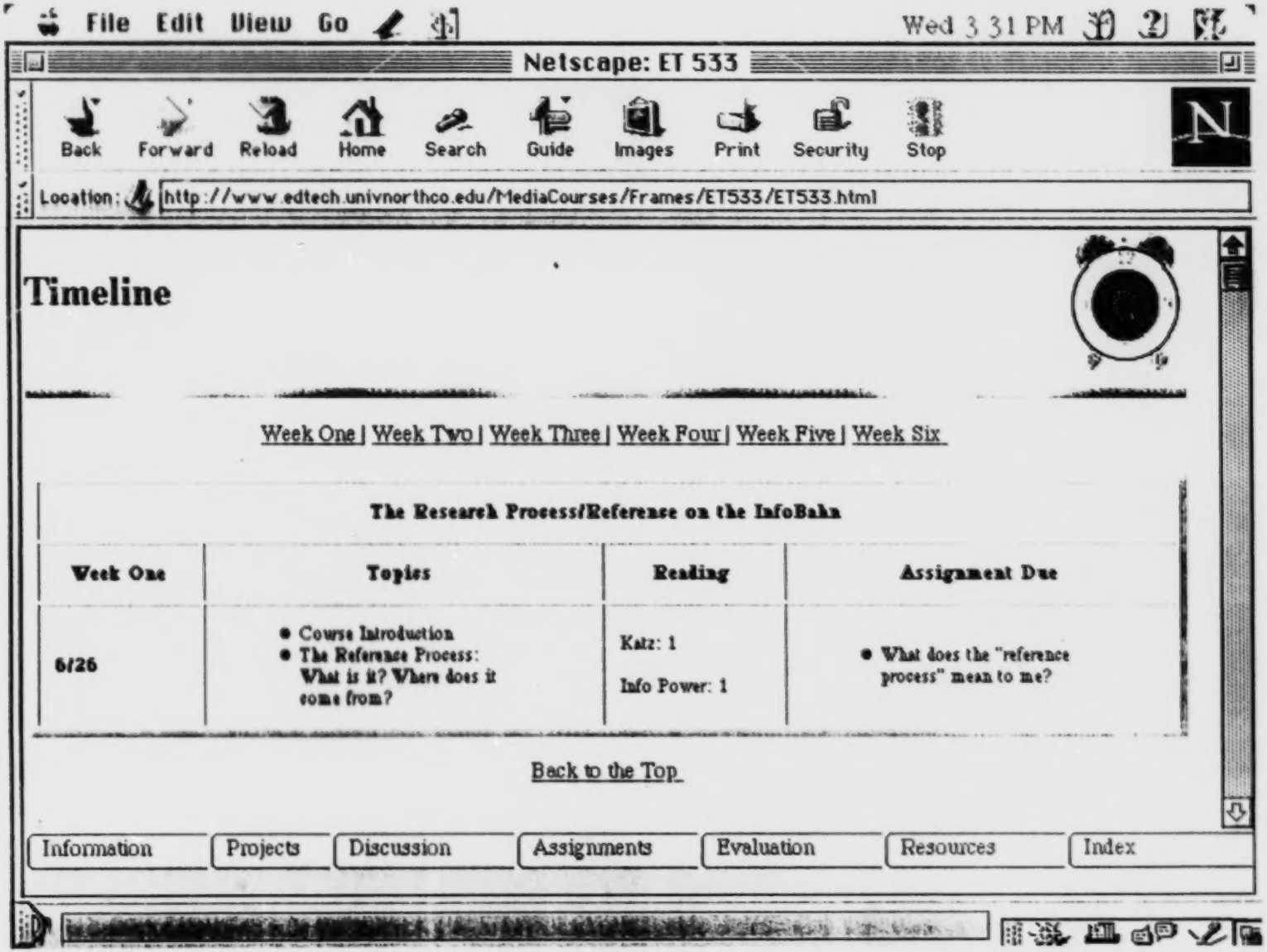
Circulation
Entrance
Welcome to the Home Page for ET 533 Reference and Information Management.
Information
Projects
Discussion
Assignments
Evaluation
Resources
Index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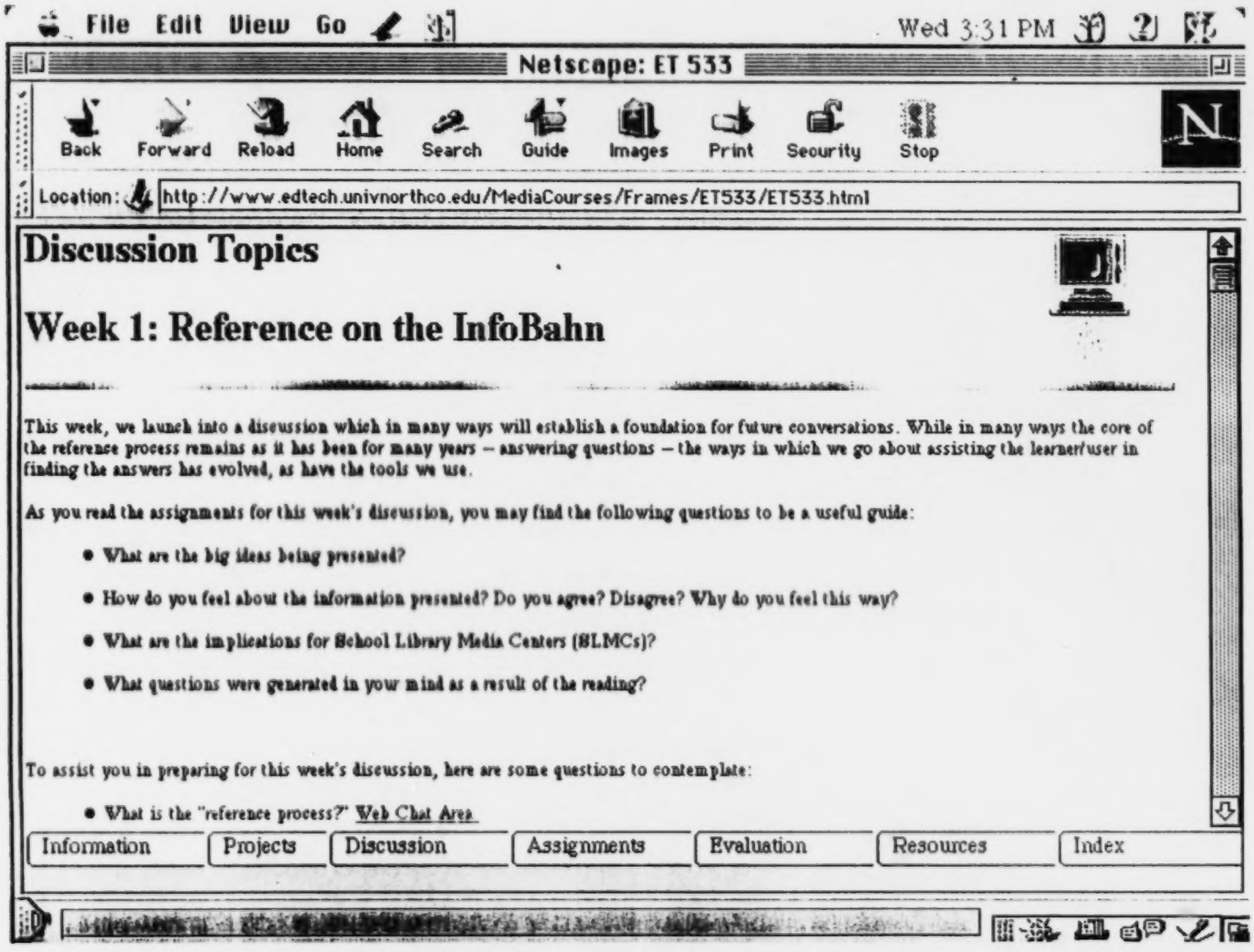
Timeline
Week One | Week Two | Week Three | Week Four | Week Five | Week Six
The Research Process/Reference on the InfoBahn
Week One
Topics
Reading
Assignment Due
6/26
• Course Introduction
• The Reference Process: What is it? Where does it come from?
Katz: 1
Info Power: 1
• What does the "reference process" mean to me?
Back to the Top
Information
Projects
Discussion
Assignments
Evaluation
Resources
Index

33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http://www.edtech.univnorthco.edu/MediaCourses/Frames/ET533/ET533.html
Discussion Topics
Week 1: Reference on the InfoBahn
This week, we launch into a discussion which in many ways will establish a foundation for future conversations. While in many ways the core of the reference process remains as it has been for many years – answering questions – the ways in which we go about assisting the learner/user in finding the answers has evolved, as have the tools we use.
As you read the assignments for this week's discussion, you may find the following questions to be a useful guide:
• What are the big ideas being presented?
• How do you feel about the information presented? Do you agree? Disagree? Why do you feel this way?
• What are the implications for School Library Media Centers (SLMCs)?
• What questions were generated in your mind as a result of the reading?
To assist you in preparing for this week's discussion, here are some questions to contemplate:
• What is the "reference process?" Web Chat Area
Information
Projects
Discussion
Assignments
Evaluation
Resources
Index